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(54) Abstract Title

Device for varnishing printed materials in an offset printing unit

(57) A device for varnishing printed materials in an offset printing unit of a rotary printing press permits fast reaction varnishing. In an offset printing unit of conventional construction with a plate cylinder 1 and a separable blanket cylinder 2, guides 8 are provided on which is set an assembly of a rastered applicator roller 9 with a separate drive and a chamber doctor 10. A pump and feed and return leads feed varnish or cleaning fluid to and from the chamber doctor. The assembly can be set against or withdrawn from the blanket cylinder 2, on either the adjacent or the opposite side to a damping unit 5.

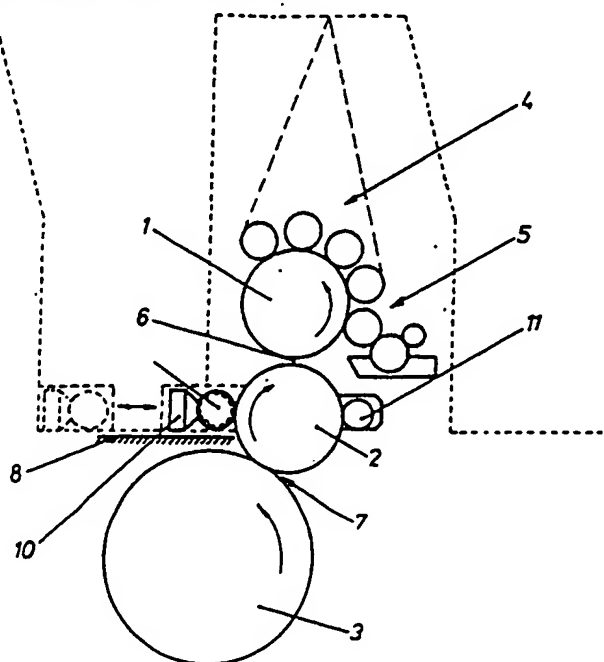


FIG.1

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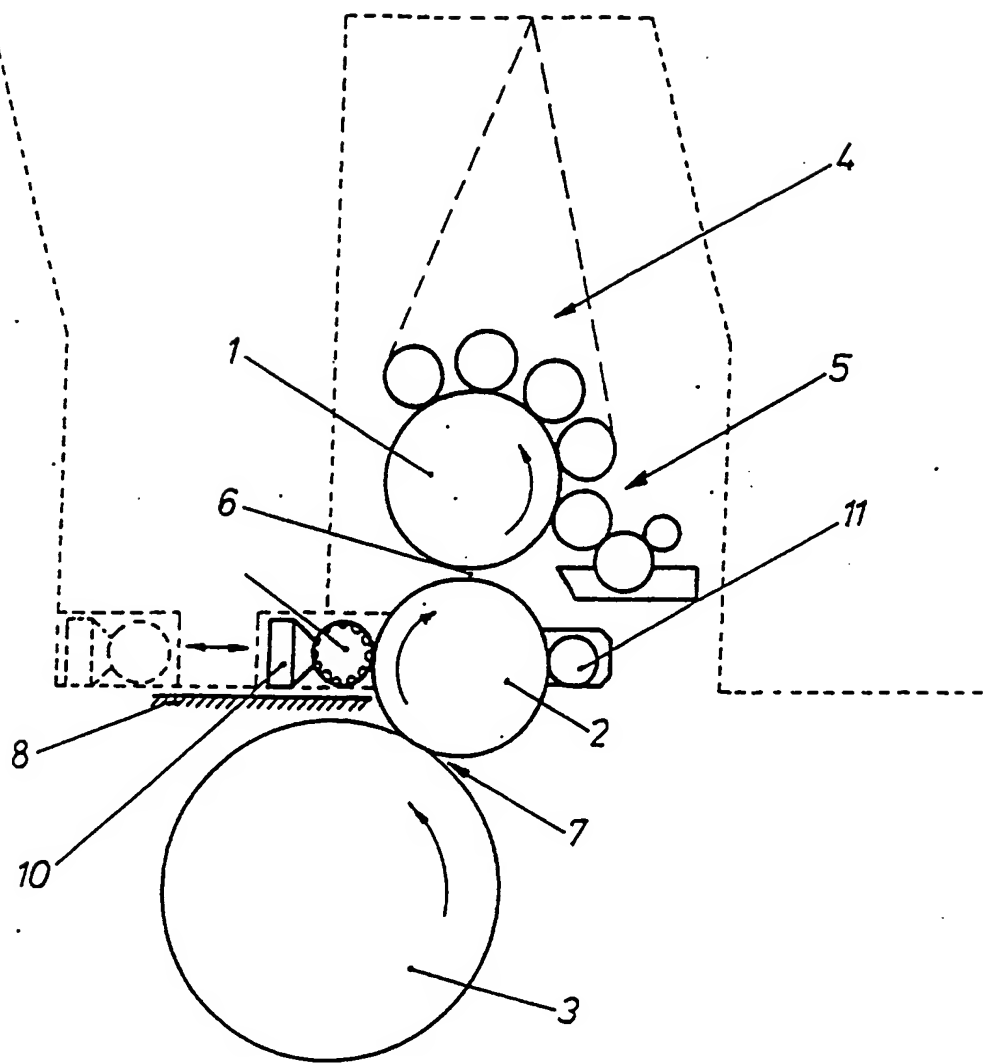


FIG.1

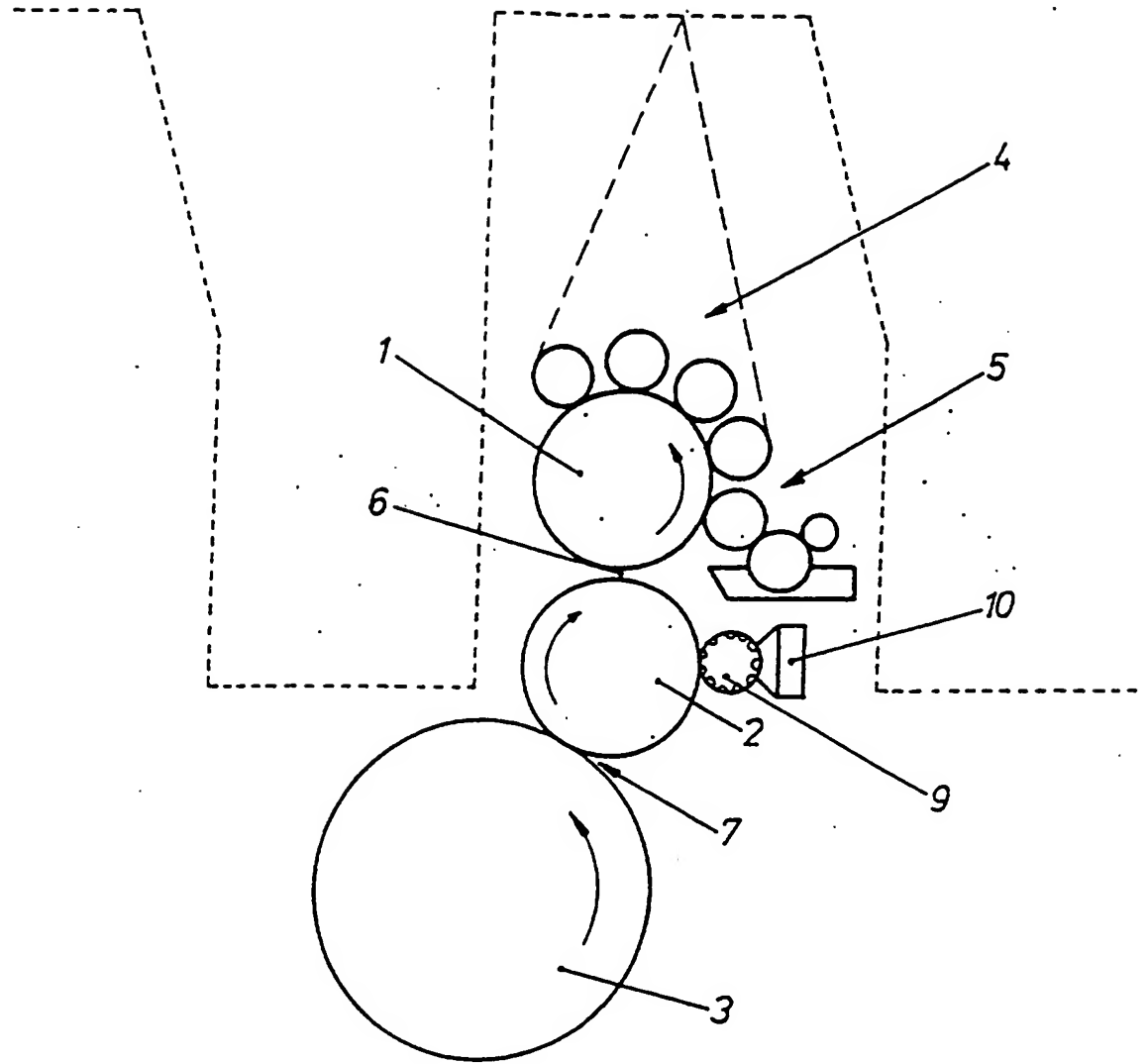


FIG. 2

- 1 -

**DEVICE FOR VARNISHING PRINTED MATERIALS**  
**IN AN OFFSET PRINTING UNIT OF A ROTARY PRINTING PRESS**

5 This invention relates to a device for varnishing printed materials in an offset printing unit of a rotary printing press.

10 A device of this type is known from DE 30 46 257 C2 and also from DD 207 358 B1. According to these, the damping unit of an offset printing press is substituted as varnishing unit which operates in accordance with the principle of the scoop roller. In accordance with DE 30 46 257 C2, the applicator roller can be brought into contact with a varnishing cylinder.

15 In contrast in accordance with DD 207 358 B1, the damping applicator rollers of an offset printing unit are, in known fashion during colour printing operation, in contact with the plate cylinder. With varnishing work in contrast, the damping agent in the damping unit is  
20 exchanged against the varnish to be worked with. The damping applicator rollers which can be brought into contact with the plate cylinder take over the function of varnish applicator rollers. The varnish application

takes place in the first embodiment indirectly from the plate cylinder via the blanket cylinder to the printed material. In a further development, the plate cylinder is set off from the blanket cylinder as well as the  
5 damping applicator rolls from the plate cylinder, so that the varnish application takes place directly via the blanket cylinder. For this, a damping applicator roller is functionally connected with an additional varnish applicator roller, wherein this varnish applicator roller  
10 can be brought into contact with the blanket cylinder.

Disadvantageous, in this connection, is that the plurality of rollers in the roller train is extended as well as the number of splitting positions raised, which  
15 is complex in operation with varnish (the varnish is viscous, varnish can dry on rapidly) as well as in the case of cleaning the rollers. Furthermore, the damping circuit can become contaminated by varnish or varnish residues.

20 From EP 0 477 283 B1, a varnishing device is known which can be brought into contact with a sheet guiding cylinder on longitudinal guides. The varnishing device consists, in this connection, essentially of an applicator roller  
25 and a scoop roller as well as a varnish storage container.

A further varnishing device is known from US Specification 4 617 865. On longitudinal guides, a  
30 device is constructed essentially of an applicator roller, a scoop roller and a varnish store container which can be brought into contact with a blanket cylinder of a printing press.

- In accordance with US Specification 5 176 077, a varnishing device is known which is arranged in the delivery of a rotary sheet printing press between circulating chain systems. The take-off drum of the delivery carries a varnish forme and acts as varnishing cylinder. Bringable into contact with this varnishing cylinder is an applicator roller which is functionally connected with its respective chamber doctor.
- 10 Finally, from EP 0 767 058 A2, an applicator device is known which is swivellable against plate cylinder and/or a blanket cylinder by means of pneumatic cylinders in a print on or print off position. The applicator device consists of an auxiliary frame, the side portions of which are connected via bearing trunnions with the side frames of an offset printing unit. In the auxiliary frame, applicator rollers are mounted which can be brought into contact with the blanket cylinder and/or the plate cylinder, which are functionally connected with a metering system. The metering system works in accordance with the scoop roller principle or with a chamber doctor.

The invention seeks to provide a device for varnishing printed materials in an offset printing unit of a rotary printing press which avoids the noted disadvantages, and one especially which permits rapid reaction varnishing and thus increases the usefulness of the offset printing unit.

- 30 In accordance with the present invention, there is provided a device for varnishing printed materials in an offset printing unit of a rotary printing press, the offset printing unit including at least one impression cylinder, a blanket cylinder and a plate cylinder, and

wherein means are provided to separate the plate cylinder from contact with the blanket cylinder, the device comprising an assembly of a rastered applicator roller and a chamber doctor functionally connected therewith, 5 guide means enabling the assembly to be set against the blanket cylinder or withdrawn therefrom, a separate drive for the rastered applicator roller feed and return leads for feeding varnish or cleaning fluid to and from the chamber doctor, and at least one pump adapted to feed 10 varnish or cleaning fluid to or from the chamber doctor.

The device is suited for operation with differing types of varnish, e.g. aqueous dispersion varnish, UV-varnish, blister varnish, or also special inks such as e.g. 15 metallic printing inks, flexo printing inks.

The device itself consists preferably of a complete module which is constructed from a rastered application roller and a chamber doctor in corresponding lateral 20 bearings, wherein the raster roller has a separate drive and the chamber doctor is linked with a separate varnish/cleaning agent circuit. As already mentioned above, the term varnish circuit here includes also comparable special inks in the circuit.

25 With the present invention, it is advantageous that an application on to the printed material takes place directly via the blanket cylinder present. The damping unit of the offset printing unit remains unchanged in its position. The damping agent circuit cannot be 30 contaminated since the varnish circuit is separate. In the contact zone of a blanket cylinder and plate cylinder separation takes place for varnishing operation. The blanket cylinder bears a planographic printing forme with



an elastic surface or an elastic letterpress forme. The device is correspondingly suited for full surface varnish application and also for cutout (spot varnishing) varnish application.

5

The quantity of varnish is evenly meterable across the entire format width determined by the drivable rastered applicator roller used as well as by the chamber doctor. On repeat orders, the quantity of varnish can be reproduced very well since the metering takes place via a separate drive of the applicator roller (independently of the press speed). The drive is, for this, preferably linkable with a central control unit via which the rotational speed is also controllable. The device in accordance with the invention with rastered applicator roller and chamber doctor permits by the small number of components rapid reaction varnishing and requires a small amount of space. The device in accordance with the invention achieves an increase in usable value for an offset printing unit, so rendering the offset printing unit more universally usable.

If the device in accordance with the invention is not needed, then this is separated from the blanket cylinder and can be moved into a parking position between the printing units or, with the aid of a lifting tool, removed totally from the rotary printing press. The offset printing unit is available again for wet or dry offset printing after a short changeover time.

30

It is of particular advantage if the rotary printing press has, as well as the offset printing units, additionally at least one varnishing unit. With this printing press arrangement, then varnishing can occur at

least twice. In the case of working with special inks, also first the special ink can be applied to the printed material in the offset printing unit by means of the device in accordance with the invention and then the  
5 varnish application takes place in the varnishing unit. Alternatively, also in an offset printing unit, first the varnish application can take place by means of the suggested device and thereon afterwards special inks, even dispersed floating into the wet varnish coating can  
10 be applied. Thereby effects of high brilliance on the printed material can be achieved.

The invention is illustrated, by way of example only, with reference to two exemplary embodiments  
15 diagrammatically represented in the accompanying drawings, in which:

Figure 1 shows schematically an offset printing unit with a device in accordance with the invention arranged on its  
20 rear side, and

Figure 2 an offset printing unit with a device in accordance with the invention arranged on its front side.

25 In a rotary offset sheet printing press with several offset printing units for multi-colour printing the device in accordance with the invention is fitted to at least one offset printing unit. The offset printing unit consists essentially of a sheet guiding impression  
30 cylinder 3, and a blanket cylinder 2 which is in contact with the impression cylinder 3 in a print zone 7. The blanket cylinder 2 carries, in the present example, a blanket. Arranged in turn relative to the blanket cylinder 2 is a neighbouring plate cylinder 1 which lies

against the blanket cylinder 2 at a contact zone 6. Upstream of this contact zone, in known fashion, there is arranged relative to the plate cylinder 1, for dry offset (waterless or damping agent free offset printing), just  
5 an inking unit 4. For wet offset printing a damping unit 5 is additionally arranged upstream of the inking unit 4 as seen in the direction of rotation of the plate cylinder 1. A blanket washing device of known construction is also shown.

10

In accordance with Figure 1 arranged on the rear side of the printing unit, i.e. on the side opposite the damping unit, are guides 8, preferably horizontal, on which the device for varnishing in accordance with the invention is  
15 movable. The device can be set on the guides 8 and mounted shiftably along guides 8 between two offset printing units in an offset press of serial construction towards or away from the blanket cylinder 2.

Alternatively the device in accordance with the invention  
20 can also be arranged between an offset printing unit and a varnishing unit arranged subsequently in the direction of transport of the printed material, a further processing unit or a delivery on the rear side of the offset printing unit. The guides 8 are, for example,  
25 arranged on the standing surface of the press cladding or integrated into this. Especially the guides 8 are formed by slide rails which on both sides within the side frame walls are let in fixed with respect to the framework and accessible from above in the machine cladding or lying  
30 under it. The machine cladding has additionally arranged relative to each individual guide 8 a narrow slot which can also be traversed by the operator through which the device in accordance with the invention can be set on the guide 8. Preferably each slot is sealed with a flexible

seal, e.g. in the form of a circulating brush bar. In the region of the blanket cylinder 2, the offset printing unit has, as part of the press cladding, approximately vertically arranged protection devices which, for  
5 positioning the device in accordance with the invention against the blanket cylinder 2, can be removed or moved out of the way so that a free space is formed.

The device consists, in this connection, at least of a  
10 rastered applicator roller 9 which is functionally connected with a chamber doctor 10. Applicator roller 9 as well as chamber doctor 10 are received at least in lateral bearings of side members and form a modular system.

15 Preferred to the rastered applicator roller 9 is a laser engraved ceramic roller driven by a separate drive, e.g. an electrical drive motor, wherein the drive can be linked by circuit technology with a central control. The  
20 chamber doctor 10 is connected with a feed lead as well as at least one return lead for the varnish or also for cleaning fluid, which, in the preferred construction, form a suitable varnish/cleaning fluid circuit. For generating an excess pressure in the interior of the  
25 chamber doctor 10, the feed lead is provided with a feed pump and a reservoir (for varnish or cleaning liquid) is arranged upstream of the chamber doctor 10 and at least one return lead is arranged downstream of the chamber doctor 10 with a suction pump. For forming the circuit,  
30 the feed lead and return lead are linked with the same reservoir.

If the rotary printing press is additionally equipped with its own varnishing unit, then the varnish/cleaning

fluid circuit of the device in accordance with the invention can also be linked with the circuit of the varnishing unit. The varnish/cleaning fluid circuits can be linked in both embodiments with a central control.

5

The mode of operation is as follows: Should the device for varnishing be put to use, then this as a modular system is moved out of a parking position (Figure 1, illustrated dashed) via the guides 8 against the blanket cylinder 2 counter to the feed direction of the printed material. If the device is seldom used, then this can also be set on to the guides 8 from outside the rotary printing press with a lifting gear and moved via the parking position to be adjacent the blanket cylinder 2. 10  
Once against the blanket cylinder 2, the device in accordance with the invention is fixed in its position e.g. mechanically locked. The setting on of the applicator roller 9 relative to the blanket cylinder 2 takes place preferably by eccentric bearings. The 15  
disposition of the chamber doctor 10 takes place on both sides by means of adjusting means, e.g. pneumatic working cylinders for the varnishing position. 20

Prior to the varnishing process, the plate cylinder 1 is set away from the blanket cylinder 2, so that separation takes place in the contact zone 6. 25

The metering takes place via the separate drive of the applicator roller 9 independently of the press speed. 30  
The chamber doctor 10 has a housing which in the direction of rotation of the blanket cylinder 2 has a positively inclined (co-running) closure doctor and a negatively inclined (counter running) working doctor. The housing has lateral sealing elements and constitutes

a reservoir for receiving varnish or special ink or cleaning liquid. The chamber doctor 10 has on its housing an upper supply circuit for varnish/cleaning liquid which is arranged in the centre and linked with a feed pump. On the lower part of the housing of the chamber doctor 10 are arranged two varnish/cleaning fluid leads coming out in the region of the side parts which are connected with the suction pump. The varnish/cleaning fluid leads are connected with one another and form a separate circuit with the corresponding reservoir. The reservoir is exchangeable so that after the ending of the varnishing process, the varnish reservoir is exchangeable against a cleaning fluid reservoir. The ink varnish or the cleaning fluid needed is continuously fed in a circuit under pressure to the chamber doctor 10 and excess varnish/cleaning fluid is sucked off. For cleaning the device in accordance with the invention, in place of varnish, the cleaning fluid is introduced into the circuit.

In accordance with Figure 2 the device in accordance with the invention is arranged on the front side, i.e. neighbouring the damping unit 5 relative to the blanket cylinder 2. The device is identical as a modular system to the arrangement described in accordance with Figure 1. The rastered applicator roller 9 with separate drive as well as the chamber doctor 10 are received in functional connection and in guides (not shown) fixed with respect to the frame and which enables the assembly to be set against the blanket cylinder 2.

Alternatively, the device can also be set in already provided mountings or bearing positions for the blanket washing device 11 and brought into contact with the

blanket cylinder 2. For this, the washing device 11 (for  
its usual position see Figure 1) is previously to be  
disassembled from its mountings or bearing positions and  
the device in accordance with the invention installed as  
5 a module into the corresponding guides. The setting on  
or off of the chamber doctor 10 takes place via the same  
adjusting means, e.g. pneumatic working cylinders which  
are usable in customary fashion for the setting on and  
setting away movement of the washing device 11. The  
10 chamber doctor 10 and the varnish/cleaning fluid supply  
are constructed as a circuit analogously to that  
described with reference Figure 1. The mode of operation  
takes place analogous to described above with reference  
to Figure 1.

CLAIMS

1. A device for varnishing printed materials in an offset printing unit of a rotary printing press, the offset printing unit including at least one impression cylinder, a blanket cylinder and a plate cylinder, and wherein means are provided to separate the plate cylinder from contact with the blanket cylinder, the device comprising an assembly of a rastered applicator roller and a chamber doctor functionally connected therewith, guide means enabling the assembly to be set against the blanket cylinder or withdrawn therefrom, a separate drive for the rastered applicator roller feed and return leads for feeding varnish or cleaning fluid to and from the chamber doctor, and at least one pump adapted to feed varnish or cleaning fluid to or from the chamber doctor.
2. A device according to Claim 1 wherein the offset printing unit includes a damping unit located on the side, and wherein the applicator roller and chamber doctor assembly and the varnish/cleaning fluid leads are installed on the side of the offset printing unit opposite that on which the damping unit is located.
3. A device according to Claim 1 wherein the offset printing unit includes a damping unit located on the side, and wherein the applicator roller and chamber doctor assembly and the varnish/damping fluid leads are arranged on the side of the offset printing unit adjacent the damping unit.
4. A device according to Claim 3 wherein the guide means for the assembly of rastered applicator roller and chamber doctor are constructed to receive, in place of



the assembly, a washing device for the blanket cylinder.

5        5.    A device according to any one of Claims 1 to 4  
         wherein the applicator roller is a laser engraved ceramic  
         roller.

10       6.    A device according to any one of Claims 1 to 5  
         wherein the chamber doctor includes, seen in the  
         direction of rotation of the applicator roller, a  
         positively inclined closure doctor as well as a  
         negatively inclined working doctor, and wherein a feed  
         pump and reservoir is arranged prior to the chamber  
         doctor to enable, in the interior of the chamber doctor,  
15       an excess pressure to be generated and at least lead with  
         one return lead with suction pumps to the reservoir is  
         arranged downstream of the chamber doctor.

20       7.    A device according to any one of Claims 1 to 6  
         wherein the guide means is integrated into a traversable  
         press cladding.

25       8.    A device according to any one of Claims 1 to 7  
         wherein the blanket cylinder carries a flexible  
         letterpress forme.

         9.    A device according to any one of Claims 1 to 7  
         wherein the blanket cylinder carries a planographic  
         printing forme with elastic surface.

30       10.   A device for varnishing printed materials in an  
         offset unit of a rotary printing press substantially as  
         hereinbefore described with reference to the accompanying  
         drawings.



Application No: GB 9815180.6  
Claims searched: 1-10

Examiner: Richard Kennell  
Date of search: 8 October 1998

**Patents Act 1977  
Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.P): B2L (LCGA); B6C (CBMB)

Int CI (Ed.6): B05C 1/08; B41F 23/08 31/14 31/30 35/04

Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	WO 90/15671 A (DAHLGREN INTL.), equivalent to reference EP 0477283, see page 14 lines 26-30, page 15 lines 8-17, page 16 lines 15-22 and page 21 lines 13-17	1 at least
X	US 4685414 A (DI RICO), see col 2 lines 56-60, col 4 lines 22-35/62-67 and col 5 lines 6-9	1 at least

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